

piece of the dunnage pad approximately 9½ feet long weighs about one pound and provides about one cubic foot of cushioning dunnage, with the latter thus having a density of about one pound per cubic foot. Other widths of pads can, of course, be produced by varying the size of the crumpler section. Varying the stock material width and/or the weight and type of paper will, of course, vary the density of the finalized pad. While the feed stock material and orientation of the mechanism has been illustrated in the drawings as being generally horizontal, it will be understood that it could be arranged for generally vertical feeding and orientation.

From the foregoing discussion and accompanying drawings, it will be seen that the invention provides a novel cushioning dunnage-producing mechanism wherein sheet-like material is rolled at its lateral edges into spiral-like form, with the rolled edge portions oriented into confronting relationship and crumpled down into a pad-like configuration, and is stitched or connected together generally centrally thereof, resulting in a pad-like dunnage product of considerably resiliency. The invention also provides a novel method of producing a pad of cushioning dunnage by combining preferably a plurality of webs of sheet-like material and rolling the edges thereof into a rolled configuration for abutting coaction and subsequently connecting or stitching together of such rolled edges centrally thereof, so as to provide a highly resilient pad-like configuration of dunnage. The invention also provides a novel dunnage product having considerable resiliency and of relatively low density per unit volume, and comprising lateral highly resilient portions formed of rolled randomly crumpled portions of sheet-like material and a central portion connected or stitched together to maintain the pad configuration of dunnage product.

The terms and expressions which have been used are used as terms of description and not of limitation and there is no intention in the use of such terms and expressions of excluding any equivalents of any of the features shown or described or portions thereof, and it is recognized that various modifications are possible within the scope of the invention claimed.

I claim:

1. In a mechanism for producing low density pad-like cushioning dunnage from sheet-like material comprising, crumpler means having an entry opening and adapted to receive sheet-like material therein, means for causing inward rolling of the lateral edges of the sheet-like material into generally rolled form prior to passage of the sheet-like material into said crumpler means, means for connecting the confronting rolled edges resulting in a unitary dunnage product of pad-like configuration, means for rotatably mounting at least one roll of sheet-like material on the mechanism, said means for causing said inward rolling including pusher means mounted on said mechanism and directed laterally causing inward rolling of the lateral edges of the sheet-like material prior to passage of the sheet-like material into said crumpler means, said entry opening of said crumpler means for receiving the sheet-like material being of a greater dimension in one direction than in the other direction, said entry opening causing the sheet-like material to be generally radially compressed as it passes through said crumpler means and the rolled edges of the sheet-like material are disposed in confronting abutting condition as they pass through said crumpler means, said connecting means comprising means for stitching the rolled edges of the sheet-like material together by coining the latter at the juncture of the rolled edges to form a unitary dunnage product of pad-like configuration.

2. A mechanism in accordance with claim 1 wherein said connecting means includes means for moving the sheet-like material through said crumpler means.

3. A mechanism in accordance with claim 1 wherein

said means for causing said inward rolling comprises pusher means extending transversely of said mechanism and disposed generally centrally thereof in a direction transverse of said mechanism and in the path of movement of the sheet-like material for engagement with the latter, said pusher means being outwardly bowed in the direction of extension of said pusher means.

4. A mechanism in accordance with claim 1 wherein said crumpler means comprises a funnel-like receiving portion defining said entry opening, a central reducing portion, and a distal end compressing portion.

5. A mechanism in accordance with claim 1 wherein said connecting means comprises vertically-spaced rotatable meshed gears disposed generally centrally of said crumpler means in a direction transverse of the latter, and adapted to stitch the confronting rolled edges of the sheet-like material together as the latter passes through said crumpler means.

6. A mechanism in accordance with claim 1 including cutter means downstream from said crumpler means for cutting the dunnage product into selected lengths.

7. A mechanism in accordance with claim 4 wherein said central reducing portion is of rectangular-like tubular construction.

8. A mechanism in accordance with claim 1 wherein said means for causing said inward rolling comprises pusher means extending to a point laterally beyond the periphery of the entry opening to said crumpler means, so that the sheet-like material moves laterally inwardly from said pusher means into the crumpler means.

9. A mechanism in accordance with claim 1 wherein said connecting means comprises rotatable geared stitcher means located on said crumpler means, and power means coupled to said stitcher means for actuating the latter whereby the sheet-like material is pulled through said crumpler means by said stitcher means as the latter coins the confronting rolled edges of the sheet-like material together.

10. A mechanism in accordance with claim 4 wherein said funnel-like portion includes arcuately-curved guide means at said entry opening for sliding engagement with the sheet-like material passing into the crumpler means.

11. A mechanism in accordance with claim 4 wherein said distal end compressing portion is of tubular-like construction having converging walls for further compressing the radially-squeezed sheet-like material emanating from said reducing portion.

12. In a mechanism for producing low density pad-like cushioning dunnage from sheet-like material comprising, crumpler means adapted to receive the sheet-like material therein, means for causing inward rolling of the lateral edges of the sheet-like material into generally rolled form prior to passage of the sheet-like material into said crumpler means, and means for connecting the confronting rolled edges resulting in a unitary dunnage product of pad-like configuration, and including means for rotatably mounting a plurality of rolls of sheet-like material on the mechanism, said means for causing said inward rolling including pusher means mounted on said mechanism and directed laterally for urging the sheet-like material into engaged condition and causing inward rolling of the lateral edges of the sheet-like material prior to passage of the sheet-like material into said crumpler means, said crumpler means being of rectangular-like tubular construction whereby the sheet-like material is generally radially compressed and the rolled edges of the sheet-like material are disposed in confronting abutting condition as they pass through said crumpler means, said connecting means comprising means for stitching the rolled edges of the sheet-like material together by coining the latter at the juncture of the rolled edges to form a unitary dunnage product of pad-like configuration.